
# V.A GSSC Databases

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# Outline

- Requirements
- Serving the community
- Data flows between the elements
- Data requirements
- GSSC processing
- Databases


# Requirements

- Our requirements are derived from
  - Science Requirements Document (433-SRD-0001)
  - Mission System Specification (433-SPEC-0001)
  - Ground System Requirements Document (433-RQMT-0006)
  - GSSC Functional Requirements Document (433-RQMT-0002)
- Other applicable documents include
  - GLAST Announcement of Opportunity (AO)
  - Project Data Management Plan (PDMP—433-PLAN-0009)
  - Operations Concept Document (433-OPS-0001)
  - GSSC-HEASARC MOU
  - Report of Data Products Working Group


# Community Connection

- A major GSSC role is providing the scientific community with data and the tools to analyze GLAST data. This entails:
  - Data ingest into the GSSC
  - Data storage at the GSSC
  - Serving data to the community through GSSC website
  - Providing the user community with analysis tools
  - Providing the user community with analysis guides
- The GSSC data archive supports the GLAST GI via
  - Providing calibration data for proposal tools
  - Supporting the GI program with proposal databases (including ToO requests)
- We support multi-wavelength observations by
  - Publishing the science timeline

# Data Requirements

- Receive data from the MOC and IOCs. (FRD 5.7.1)
  - Level 0 data from the MOC
  - Processed data from the IOC's (levels 1, 2 & 3)
  - Reports and Analyses from the MOC
  - GLAST related GCN notices
- Maintain databases for all the data products we receive from the MOC or IOCs. (FRD 5.7.2)
- These databases will be physically connected to the HEASARC computer system (FRD 5.7.3)
- Most databases will be accessed though the GSSC website in accordance with the Mission data policies (FRD 5.7.4)
  - Processed data from the IOC's and GSSC
  - Observation timelines
  - ToO requests
  - Instrument commands will NOT be publicly available


# Data Requirements, cont.

- The GSSC data and software will be transferred to the HEASARC by the end of the mission. (FRD 5.7.5, 5.7.6)
  - The GSSC databases will be HEASARC-compatible.
  - If there is a case where the GSSC creates a database in a non-HEASARC compatible form, a HEASARC-compatible version will be transferred by the end of the mission.

# GSSC Data Processing

- Data products will be available to the public within 24 hrs of the receipt of the data from the MOC and IOC's (FRD 5.6.3)
- The GSSC will produce LAT exposure maps (FRD 5.6.4)
- FRD goals are to produce
  - LAT all-sky maps
  - Expanded LAT maps of special regions such as 3C279/3C273 and the Galactic anti-center
  - LAT lightcurve for the Crab
  - GRB localizations and time profiles for ~10 strong GRBs per year from LAT and GBM data
  - Lightcurves for a number of strong sources (e.g., 3C 273).

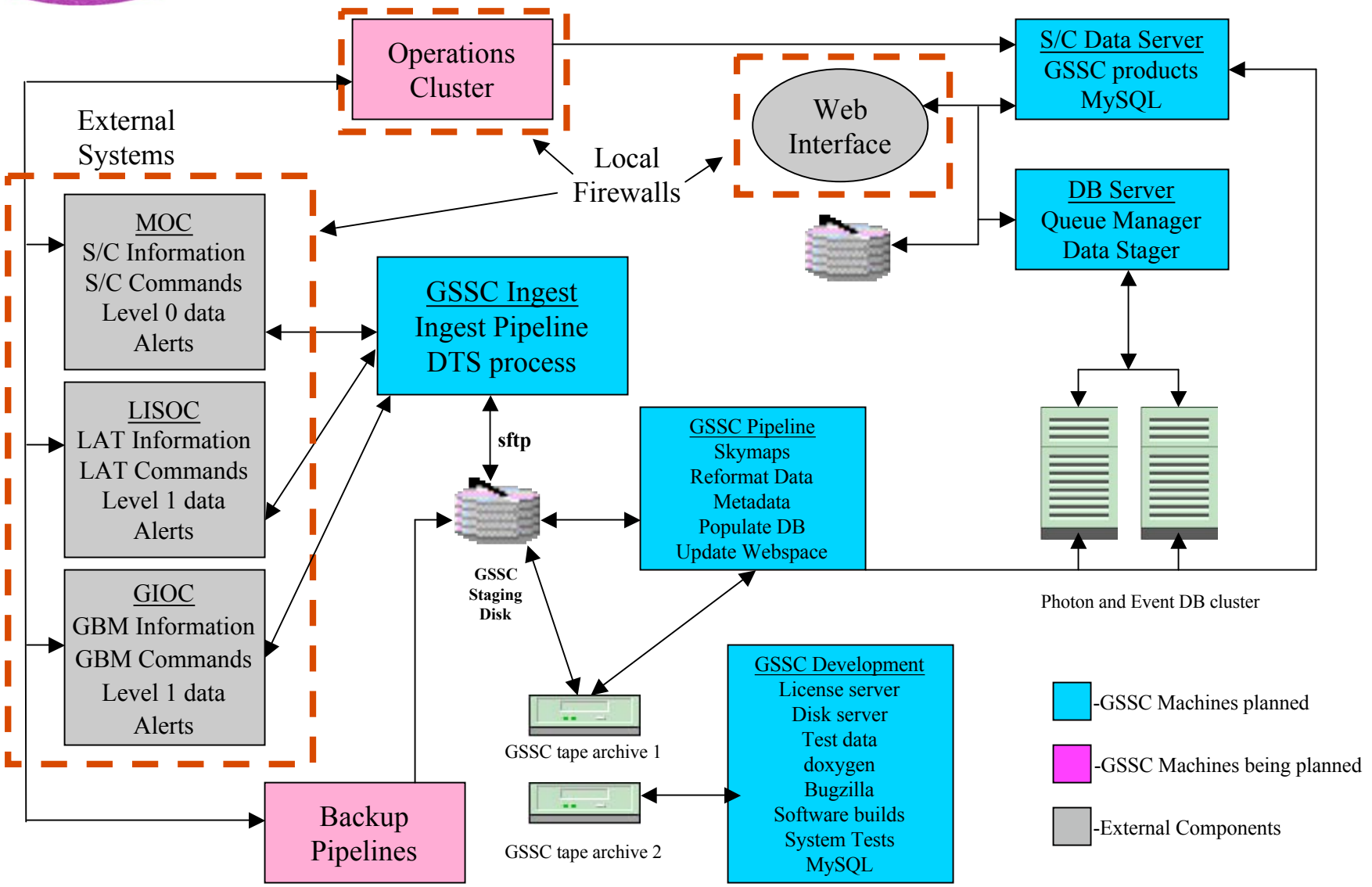
# GSSC Data Processing, cont.

- The GSSC will maintain a backup level 1 pipeline for the LAT and for the GBM (FRD 5.6.5).
  - These pipelines will only be run with the concurrence and supervision of the relevant instrument team.

# Databases

- All science data flowing into the GSSC are stored in databases. See §V.B.i and §V.B.iv for a complete list of the science databases, §V.B.ii for the operations databases, §V.B.iii for the user support databases.
- The data storage and access drivers are the LAT event and photon databases. See §V.B.i for the implementation of these databases.
  - Event database
    - All events with many reconstruction parameters
    - Most likely will be searched infrequently
  - Photon database
    - All events categorized as photons with a subset of the event parameters
    - Will be searched very frequently
- Almost all the databases can be accessed through the GSSC website via the Browse interface. See §V.B.iv.

# GSSC Computer Architecture




# Summary

- We've reviewed the requirements for
  - Data storage at the GSSC
  - Data flow from the different ground elements to the GSSC
  - Data processing at the GSSC
  - Available databases